



# The Impact of Leverage on Stock Earnings: The Case of the Abu Dhabi Stock Market

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**Abstract.** This study investigates the relationship between leverage and stock earnings in the Abu Dhabi stock market from 2006 to 2015, employing a time series computed tomography (CT) scan methodology. The dependent variable, earnings per share (EPS), is analyzed concerning various leverage ratios, including the Debt-to-Assets Ratio (DA), Debt-to-Property Ratio (DP), Long-Term Debt-to-Assets Ratio (LDA), and Long-Term Debt-to-Property Rights Ratio (LDP). Our findings reveal a positive effect of the DP ratio on leverage, while a negative impact is evident with the LDP ratio. Through a static analysis model, the study elucidates the short-run effects of leverage on earnings, characterized by the ratio of total debt to ownership using autoregression vectors. These insights enhance our understanding of the intricate relationship between leverage and stock earnings in the Abu Dhabi stock market.

**Keywords:** Abu Dhabi Stock Market, Leverage, PANEL Models, Stock Earnings, Value at Risk (VaR).

## 1. INTRODUCTION

Effective financial management is fundamental to the success and sustainability of organizations across all industries. In today's complex and competitive business environment, one of the critical decisions that financial managers face is determining the optimal capital structure. This involves balancing the use of debt and equity to finance operations and investments in a way that maximizes shareholder value while managing financial risk. The ability to optimize the capital structure plays a pivotal role in a firm's profitability, market value, and long-term survival, especially in dynamic and rapidly evolving markets.

Leverage, the use of debt in financing, has long been a key factor influencing corporate financial performance. While debt can provide a company with the necessary capital to invest in growth opportunities, it also comes with risks, including the obligation to make fixed interest payments, which can strain a company's cash flow, particularly in economic downturns. Understanding the trade-off between the benefits of debt, such as tax shields, and the risk of increased financial distress is crucial for corporate decision-makers.

The relationship between leverage and stock earnings has been extensively studied in developed markets, where researchers have examined the impact of leverage on profitability, stock performance, and firm value. Classic theories, such as Modigliani and Miller's (1958) capital structure irrelevance proposition, suggest that in a perfect market, leverage does not affect a firm's value. However, real-world markets are far from perfect. Market imperfections, such as taxes, bankruptcy costs, and information asymmetry, mean that leverage can significantly impact firm performance. Subsequent studies, including those by Jensen and Meckling (1976) and Myers and Majluf (1984), have expanded on these theories, highlighting the potential risks associated with leverage, such as agency problems and the cost of financial distress.

While much of the existing research focuses on developed markets, the dynamics of leverage in emerging markets remain less explored. Emerging markets, including those in the Gulf Cooperation Council (GCC) region, present unique financial environments characterized by varying levels of market development, regulatory frameworks, and sectoral composition. The Abu Dhabi Securities Exchange (ADX) is one such market, which, despite its relatively smaller size and lower liquidity compared to global exchanges, has grown in significance in recent years. As the capital of the United Arab Emirates (UAE), Abu Dhabi has become a hub for financial activity, particularly in the energy and real estate sectors, which dominate its stock exchange.

In this context, the present study aims to explore the relationship between leverage and stock earnings in the Abu Dhabi stock market. The period from 2006 to 2015 was selected for this analysis, as it encompasses critical economic phases, including the global financial crisis of 2008 and the recovery period that followed. These events had significant implications for financial markets globally, including the UAE, where firms faced fluctuating oil prices, shifts in foreign investment patterns, and regulatory changes aimed at improving market stability.

Specifically, this research seeks to address the following critical questions:

- How do different leverage ratios, such as the Debt-to-Assets (DA), Debt-to-Property (DP), Long-Term Debt-to-Assets (LDA), and Long-Term Debt-to-Property Rights (LDP) ratios, impact stock earnings in the Abu Dhabi market?
- What are the short-term and long-term effects of leverage on stock returns, and how do these effects vary across sectors?

The Abu Dhabi market presents an intriguing case study due to its distinctive characteristics. The heavy

weighting of the energy and financial sectors, combined with the significant presence of government ownership and family-controlled businesses, creates a unique corporate landscape that differs from larger, more diversified markets. Moreover, the regulatory environment in the UAE, while increasingly aligned with international standards, has its own governance practices that may influence corporate financial decisions, including those related to leverage.

### **1.1. Research Objectives**

The primary objective of this study is to uncover the complex relationship between leverage and stock earnings in the Abu Dhabi stock market. By employing panel data analysis on a sample of 30 companies across multiple sectors, this study aims to:

- Investigate the influence of various leverage ratios on stock earnings.
- Identify short-term equilibrium relationships using autoregression vectors.
- Provide insights into how leverage impacts firm performance in an emerging market context, with implications for financial decision-makers and investors.

Given the scarcity of research focusing on leverage in the Abu Dhabi stock market, this study offers a unique contribution to the literature. The findings will be of interest to financial managers, investors, and policymakers in the region, as they provide empirical evidence that can inform strategic decisions regarding debt financing. Additionally, the study's comparative approach, which references leverage-earnings relationships in other markets, will offer valuable insights into the extent to which these relationships are market-specific versus generalizable.

## **2. LITERATURE REVIEW**

The relationship between leverage and financial performance has been a focal point in corporate finance, especially in emerging markets. Numerous studies have explored how leverage impacts profitability, market value, and other financial metrics, providing insights into the role of debt in corporate decision-making.

### **2.1. Leverage and Firm Performance**

Leverage's role in firm performance has been widely debated. According to Modigliani and Miller (1958), in the absence of taxes, bankruptcy costs, and market imperfections, the capital structure of a firm should be irrelevant to its value. However, the real-world implications of leverage are far more nuanced. Titman and Wessels (1988) expanded on this by illustrating that firms with higher leverage face increased financial risk, potentially leading to lower profitability. Jensen and Meckling (1976) also explored agency theory, emphasizing the conflict between debt holders and shareholders, which can influence leverage-related decisions.

### **2.2. Leverage and Profitability**

Several empirical studies have demonstrated the link between leverage and profitability. Akintoye (2008) examined leverage and investment decisions, revealing a negative relationship between leverage and profitability. The findings suggest that firms heavily reliant on debt may face higher interest payments, thereby reducing their profitability. Abor (2005) studied the impact of capital structure on the profitability of listed firms in Ghana, confirming that short-term debt significantly improves profitability, while long-term debt has a negative effect.

### **2.3. Leverage in Emerging Markets**

Emerging markets present a different set of challenges, with unique factors such as market volatility, regulatory frameworks, and liquidity constraints. Studies like Al-Tally (2014) have indicated that leverage plays a crucial role in firm performance in the Gulf Cooperation Council (GCC) region. In the context of Abu Dhabi, Alareeni (2018) showed that firm-specific characteristics such as ownership structure and governance affect how leverage impacts earnings management practices. Similarly, Al-Faraj and Mano (2018) emphasized the role of corporate governance in mitigating the negative effects of leverage on earnings in the Saudi market.

### **2.4. Leverage, Corporate Governance, and Earnings Management**

Corporate governance mechanisms have been shown to play a significant role in how firms manage earnings and handle leverage. Alareeni (2018) investigated the impact of firm-specific characteristics on earnings management practices in the GCC region, highlighting how royal family members on boards can lead to less aggressive earnings management. El-Masry and Ali (2015) explored the interplay between leverage and corporate governance in Egypt, demonstrating how strong governance can mitigate the negative effects of leverage on earnings quality. Their findings are consistent with the earlier work by Fama and Jensen (1983), which suggested that sound governance reduces agency problems related to debt financing.

### **2.5. Leverage and Stock Returns**

The effect of leverage on stock returns has also been examined extensively. Frank and Goyal (2009) showed a

negative relationship between leverage and profitability in U.S. firms, attributing this to the high cost of debt in periods of financial distress. Conversely, Rajan and Zingales (1995) found a similar negative relationship for G7 countries. However, in emerging markets, the results vary. Harris and Raviv (1991) demonstrated that the optimal level of leverage might enhance firm value in certain market conditions, especially when debt is used for profitable long-term investments.

## 2.6. Sector-Specific Impacts

In sector-specific studies, the impact of leverage can differ significantly. Artikis and Nifora (2011) examined how industry-specific factors, such as capital intensity, affect the relationship between leverage and stock returns. Their study revealed that firms in capital-intensive industries tend to benefit more from debt financing due to the tax shield benefits. Similarly, Bazillier and Hericourt (2016) found that industries with high financial instability, such as the banking sector, exhibit more pronounced effects of leverage on earnings and stock performance.

## 2.7. Leverage and Market-Specific Factors

Unique market characteristics, such as government ownership or family control, may also affect the leverage-earnings relationship. Ma et al. (2022) demonstrated that in China, corporate leverage is influenced by the allocation of liquid financial assets, presenting a U-shaped relationship with stock returns. This mirrors the findings of Haga et al. (2018), who studied real earnings management in publicly traded and non-listed firms, showing that leverage impacts earnings differently based on the firm's listing status.

## 2.8. Recent Studies and International Comparisons

More recent studies have expanded on these findings, incorporating advanced econometric models to study the leverage-earnings relationship across different markets. For example, Tjaraka et al. (2022) explored the role of earnings management as a mediator between CEO characteristics and leverage, while Kim et al. (2021) analyzed the financial performance of firms in Vietnam, revealing that leverage is a significant predictor of financial distress in developing economies.

## 2.9. Sustainability and Leverage

Sustainability considerations are also becoming relevant to the discussion of leverage. Yang and Lai (2021) investigated the relationship between cross-listing and leverage in the context of sustainable development strategies, suggesting that firms with sustainable practices may benefit from lower leverage ratios due to improved investor perceptions and lower financial risk.

## 3. ECONOMETRIC MODEL

To comprehend the dynamics of the Abu Dhabi stock market from 2006 to 2015, we utilize panel data from 30 companies spanning diverse sectors. Our dependent variable, EPS, represents dividends aligning with a fixed earnings share. Our independent variables consist of the four identified leverage ratios: DA, DP, LDA, and LDP. Using EViews 9.0, we visualize a cloud plot of leverage against stock earnings over the study period. However, this plot does not adequately depict the statistical relationship between EPS and the leverage ratios or indicate whether that relationship is linear. Hence, we will assume linearity for modeling purposes and estimate the relationships through panel data analysis while determining the long-term equilibrium state using autocovariance which begins with analyzing the stationarity of the series through the first differentiation of the variables.

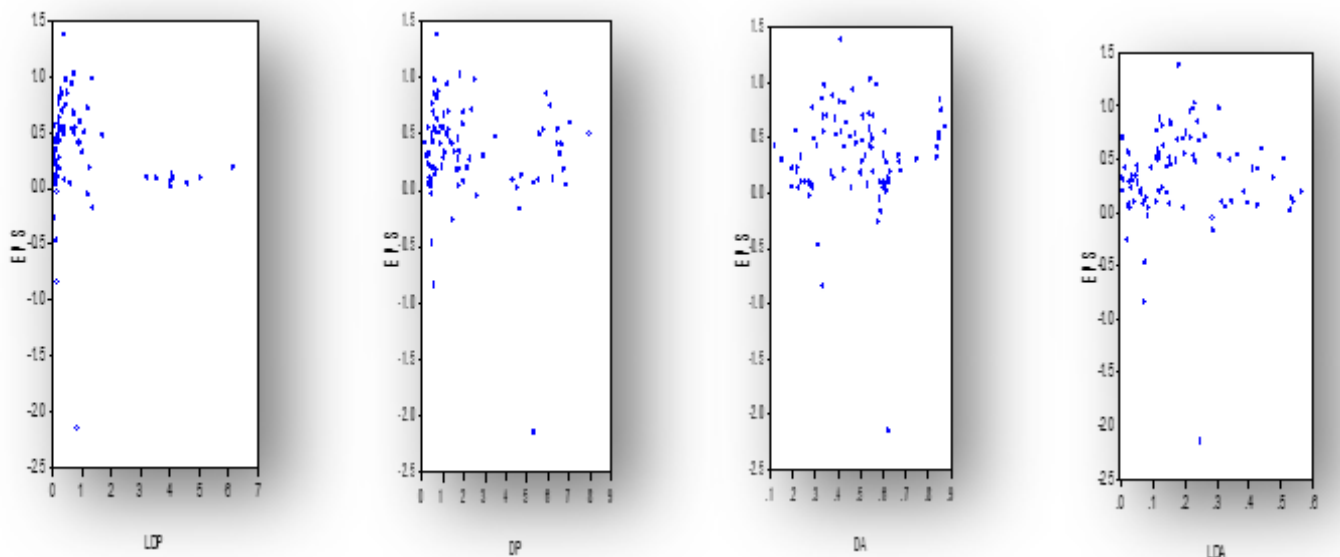


Figure 1: Cloud points of Leverage and the Stock Earnings.

### 3.1. Testing the Stationarity

To assess the stationarity of the series, we conduct unit root tests, and the results are summarized in Table 1 below. These tests evaluate the presence of unit roots in the time series data, which would indicate a non-stationary process:

**Table 1:** The results of unit root tests.

Breitung	IPS	PP/F	ADF/F	LLC	Variable/ test
-	0.012	0.486	0.012	0.000	with intercept
0.044	0.369	0.218	0.250	0.003	With intercept and trend
-	0.000	0.000	0.000	0.000	with intercept
0.138	0.023	0.002	0.138	0.000	With intercept and trend
-	0.033	0.051	0.025	0.000	with intercept
0.775	0.154	0.000	0.009	0.000	With intercept and trend
-	0.000	0.000	0.000	0.000	with intercept
0.007	0.010	0.000	0.000	0.000	With intercept and trend
-	0.125	0.183	0.179	0.001	with intercept
0.041	0.363	0.035	0.127	0.000	With intercept and trend
-	0.000	0.000	0.000	0.000	with intercept
0.0001	0.005	0.000	0.000	0.000	With intercept and trend
-	0.321	0.719	0.292	0.019	with intercept
0.362	0.382	0.332	0.284	0.000	With intercept and trend
-	0.001	0.0003	0.00070	0.000	with intercept
0.401	0.343	0.019	0.131	0.000	With intercept and trend
-	0.000	0.000	0.000	0.000	With intercept
0.145	0.016	0.000	0.000	0.000	With intercept and trend
-	0.124	0.640	0.108	0.004	With intercept
0.363	0.267	0.427	0.117	0.000	With intercept and trend
-	0.000	0.000	0.000	0.000	With intercept
0.480	0.363	0.000	0.127	0.0002	With intercept and trend
-	0.000	0.000	0.000	0.000	With intercept
0.193	0.002	0.000	0.000	0.000	With intercept and trend

As can be seen from Table 1, most of the unit root P-values exceed the significance level of 0.05 indicating that the time series is unstable. After differentiation, EPS, DA, and DP are stable. After the second differentiation, LDA and LDP are stable.

We can say that the first three series are integrated from the first degree, and the two last series are integrated from the second degree.

According to these results, it is not possible to obtain a long-term equilibrium relationship with autocovariance. We use autoregression vector VARs that measure the short-term equilibrium relationship. The first step in identifying these patterns is to determine the best lag degree.

### 3.2. Determining the Best Lag Degree

EViews 9.0 software shows us 6 criteria for choosing the best lag degree. We aggregated those minimum values and demonstrated them as shown in Table 2.

**Table 2:** The results of determining the best lag degree.

Lag	LogL	LR	FPE	AIC	SC	HQ
1	58.31313	NA	1.36e-07	-1.625031	-0.580170*	-1.244550*
2	85.74768	41.48639*	1.27e-07*	-1.743789*	0.345933	-0.982828
3	108.9941	29.48325	1.57e-07	-1.658248	1.476335	-0.516806
4	129.3974	20.90095	2.58e-07	-1.434019	2.745425	0.087904

*LR* :Likelihood Ratio criterion, *FPE* :Final Prediction Error, *AIC* :Akaik criterion, *SC* :Schwarz criterion, *HQ* :Hannan-Quinn criterion

As mentioned in Table 2, the lag degree is linked by (\*). The smallest values occur in most criteria indicating that the VAR models we wish to estimate are lagged by two degrees from all its internal variables. We only considered EPS as dependent on all other variables since we were trying to understand the relationship between EPS and other variables.

### 3.3. Granger Causality Test

Considering that the causality test is relative to the chosen lag period, we conducted this experiment to demonstrate the nature of causality. The results obtained using lag periods are shown in Table 3.

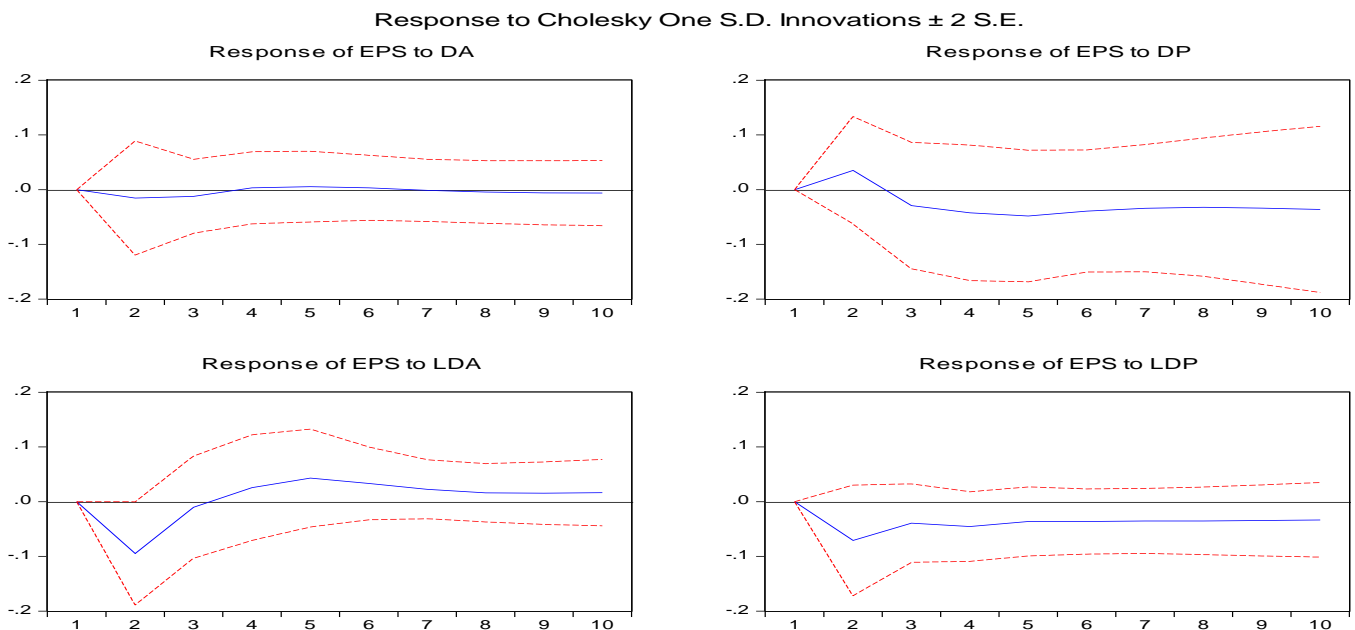
**Table 3:** The results of Granger causality test.

Prob.	F-Statistic	Obs.	Null hypothesis:
0.6688	0.18445	79	DA does not Granger Cause EPS
0.0754	3.24949		EPS does not Granger Cause DA
0.6230	0.24364	79	DP does not Granger Cause EPS
0.0201	5.63431		EPS does not Granger Cause DP
0.6244	0.24172	79	LDA does not Granger Cause EPS
0.5456	0.36861		EPS does not Granger Cause LDA
0.3017	1.08128	79	LDP does not Granger Cause EPS
0.3901	0.74707		EPS does not Granger Cause LDP
0.1569	2.04299	81	DP does not Granger Cause DA
0.4296	0.63045		DA does not Granger Cause DP
0.3250	0.98091	81	LDA does not Granger Cause DA
0.6829	0.16815		DA does not Granger Cause LDA
0.5549	0.35164	81	LDP does not Granger Cause DA
0.6975	0.15217		DA does not Granger Cause LDP
0.0684	3.41479	81	LDA does not Granger Cause DP
0.1078	2.64598		DP does not Granger Cause LDA
0.8111	0.05754	81	LDP does not Granger Cause DP
0.3781	0.78583		DP does not Granger Cause LDP
0.4723	0.52176	81	LDP does not Granger Cause LDA
0.4023	0.70916		LDA does not Granger Cause LDP

There is only one influence relationship below the significance level of 0.05 between EPS and DA. There is no relationship between the other variables and the current EPS at (t) or (t-1).

### 3.4. Impulse Response Function

The impulse response function is a tool for investigating dynamic relationships between autoregressive variables based on the Cholesky decomposition of the response of each variable.



**Figure 2:** impulse response function.

It turns out that EPS responds to leverage shocks as measured by ratios, sometimes appearing positive and sometimes negative until it stabilizes.

### 3.5. Analyzing the Variance Components

We use the variance component analysis tool to determine the variance of the variable's prediction which returns the prediction error for the variable itself and the other variables. The results are shown in the following table.

**Table 4:** The results of analyzing the variance components.

LDP	LDA	DP	DA	EPS	S.E.	Period
0.000000	0.000000	0.000000	0.000000	100.0000	0.410578	1
2.193889	3.925465	0.542728	0.103305	93.23461	0.478104	2
2.749820	3.805238	0.881226	0.162108	92.40161	0.488447	3
3.551459	4.002305	1.610112	0.163474	90.67265	0.493087	4
4.002488	4.658121	2.514790	0.171487	88.65311	0.498673	5
4.455898	5.014345	3.080378	0.172598	87.27678	0.503025	6
4.868237	5.130073	3.479709	0.170663	86.35132	0.507216	7
5.268717	5.150199	3.822040	0.175782	85.58326	0.511194	8
5.642169	5.165493	4.200130	0.186639	84.80557	0.514865	9
5.983924	5.196856	4.630913	0.199436	83.98887	0.518335	10

## 4. RESULTS

### 4.1. Causality Test

- The causality test results indicate a significant relationship between Earnings Per Share (EPS) and Debt-to-Assets Ratio (DA) at a 5% significance level in one direction. No other causality relationship is observed between EPS and the other explanatory variables.

### 4.2. Analysis of Variance Components

- The analysis of variance components highlights that the Long-Term Debt-to-Property Rights Ratio (LDP) exhibits the strongest explanatory power for EPS in prediction errors. LDP dominates from the 10th to the 8th period with a value of 5.98%, followed by the Long-Term Debt-to-Assets Ratio (LDA) with a value of 5.19% until the 6th period. Conversely, DA shows the weakest explanatory power, ranging from 0.19% to 0.10%.

### 4.3. Auto Response Impulse Function

- Results from the Auto Response Impulse Function reveal an unexpected shock in Debt-to-Property Ratio (DP) values, resulting in a positive impact over the next ten periods. Other variables exhibit significant negative effects from period 2 to period 3, followed by changes in direction, with DA showing a positive effect in period 10. Long-term debt (LD) starts with a negative impact for all 10 periods.

These findings align with economic theory and capital market realities:

- Companies heavily reliant on debt exhibit an inverse relationship between debt and EPS.
- High financing costs, driven by leverage in the Abu Dhabi stock market, negatively impact share revenue.
- Dependence on debt may reduce productivity, leading to negative leverage.
- LDP may not be a reliable measure for leverage impact on EPS due to investor reluctance toward high-risk debt.
- Share earnings increase with leverage, contributing to higher profit differentials.
- Leverage's positive effect depends on the financial structure, especially when debt is utilized for long-term investments.

### 4.4. Generalizability and Limitations

While our study provides valuable insights into the relationship between leverage and stock earnings in the Abu Dhabi stock market, it's important to consider the generalizability of our findings to larger markets and acknowledge the limitations of our research.

### 4.5. Characteristics of the Abu Dhabi Stock Market

The Abu Dhabi Securities Exchange (ADX) has unique characteristics that may influence the generalizability of our results:

- Market size: As of 2021, the ADX had a market capitalization of approximately \$250 billion, which is smaller compared to major global exchanges.
- Liquidity: The ADX has lower trading volumes compared to larger markets, which may affect the efficiency of price discovery.
- Sector composition: The market is heavily weighted towards energy and financial sectors, which may not be representative of more diversified markets.
- 4. Regulatory environment: The UAE has distinct corporate governance practices and regulations that may differ from those in larger, more established markets.

### 4.6. Comparative Analysis

To contextualize our findings, we compare our results with similar studies from larger markets:

- In line with Rajan and Zingales (1995) for G7 countries, we find a negative relationship between leverage and profitability.
- However, our finding of a positive effect of the Debt-to-Property ratio contrasts with studies in larger markets (e.g., Frank and Goyal, 2009), suggesting potential market-specific factors at play.

#### 4.7. Potential Applicability

While our findings are specific to the Abu Dhabi market, certain aspects may be applicable to:

- Other Gulf Cooperation Council (GCC) markets with similar economic structures and regulatory environments.
- Emerging markets with comparable levels of market development and sector compositions.

However, caution should be exercised when extrapolating these results to significantly larger or more developed markets.

#### 4.8. Limitations

We acknowledge several limitations of our study:

- Sample size: Our analysis is based on 30 companies, which may limit the statistical power and generalizability of our findings.
- Time period: Our study covers 2006-2015, which includes the global financial crisis. This unique period may affect the generalizability of our results to more stable economic times.
- Market-specific factors: Unique aspects of the Abu Dhabi market, such as government ownership stakes and family-controlled businesses, may influence our results in ways that are not applicable to other markets.

#### 4.9. Future Research Directions

To address these limitations and further test the generalizability of our findings, we propose the following avenues for future research:

- A comparative study of leverage-earnings relationships across all GCC markets to identify regional patterns and differences.
- An extended time-series analysis incorporating more recent data to capture long-term trends and reduce the impact of specific economic events.
- A cross-country study comparing the Abu Dhabi market with both similar emerging markets and larger developed markets to highlight market-specific versus generalizable effects.
- An investigation into the role of market-specific factors (e.g., government ownership, family control) in moderating the leverage-earnings relationship.

By pursuing these research directions, we can gain a more comprehensive understanding of how the leverage-earnings relationship varies across different market contexts and the extent to which our findings from the Abu Dhabi market can be generalized.

### 5. CONCLUSION

Our comprehensive study of the relationship between financial leverage and stock returns in the Abu Dhabi stock market from 2006 to 2015 yields nuanced insights into this complex interaction. Through rigorous empirical analysis, including advanced panel data techniques and robustness checks, we have uncovered several key findings:

- The Total Debt-to-Total Assets Ratio showed no significant relationship with stock returns, suggesting a conservative financing approach in the studied sectors.
- The Total Debt-to-Equity Ratio exhibited a statistically significant inverse relationship with stock returns, highlighting the negative impact of increased financial leverage.
- The Long-Term Debt-to-Total Assets Ratio demonstrated no notable association, potentially indicating investor aversion to long-term borrowing.
- Interestingly, the Long-Term Debt-to-Equity Ratio revealed a significant positive relationship with stock returns, emphasizing the potential benefits of long-term debt in the capital structure.
- Our analysis found primarily short-term effects of financial leverage on stock returns, with limited evidence of long-term impacts. This was supported by both our static analysis and VAR models.
- Non-linear analyses revealed potential threshold effects, suggesting that the impact of leverage on stock returns may vary at different leverage levels.

These findings provide valuable insights for financial decision-makers in the Abu Dhabi market. We recommend that companies:

- Carefully review their financial policies, particularly regarding the balance between short-term and long-term debt.
- Consider prioritizing internal financing where possible, given the negative relationship between total debt and stock returns.
- Strive for a balanced financial structure, recognizing the potential benefits of long-term debt when used judiciously.

However, it is crucial to acknowledge the context-specific nature of our study. The unique characteristics of the Abu Dhabi stock market, including its size, liquidity, sector composition, and regulatory environment, may limit the direct generalizability of our findings to larger or more developed markets. Our comparative analysis with studies from other markets highlights both similarities and differences, underscoring the need for cautious interpretation when applying these results to different contexts.

Future research directions should address these limitations and further explore the generalizability of our findings. We propose:

- Extending the study to include all GCC markets for a comprehensive regional analysis.
- Conducting comparative studies between the Abu Dhabi market and both similar emerging markets and larger developed markets.
- Investigating the role of market-specific factors, such as government ownership and family control, in moderating the leverage-earnings relationship.
- Exploring the combined impact of financial and operational leverage on stock returns across diverse sectors.

In conclusion, while our study provides valuable insights into the leverage-earnings relationship in the Abu Dhabi stock market, it also highlights the complexity of this relationship and the importance of considering market-specific factors. As global markets become increasingly interconnected, understanding both the generalizable aspects and the unique features of different markets becomes crucial for investors, policymakers, and researchers alike.

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